

CLAIMS

I claim:

1. A vaccine comprising all or a portion of a stress protein which induces an immune response in an individual to whom it is administered or all or a portion of a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the stress protein to be capable of inducing an immune response in an individual to whom it is administered.
2. A vaccine of Claim 1 in which the stress protein is a mycobacterial stress protein or a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the mycobacterial stress protein to induce an immune response in the individual to whom it is administered.
3. A vaccine for use in enhancing in an individual the immune response to a pathogen, comprising all or a portion of a stress protein of the pathogen against which the enhanced response is desired.
4. A vaccine of Claim 3 in which the stress protein is selected from the group consisting of: mycobacterial stress proteins, bacterial stress proteins, fungal stress proteins, viral stress proteins and parasitic stress proteins.
5. A composition comprising all or a portion of a selected stress protein, for use in producing or enhancing an immune response in an individual, wherein the stress protein is in sufficient quantity to elicit the desired immune response.

6. A composition comprising a stress protein for use in immunizing an individual against a subsequent infection by a pathogen, wherein the stress protein is in sufficient quantity to produce an immune response to the stress protein.

5

7. The composition of Claim 6 wherein the stress protein is a stress protein of the pathogen.

8. A composition comprising all or a portion of a stress protein or all or a portion of a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the stress protein for use in inducing in an individual immune tolerance against a protein, under conditions appropriate for induction of the desired tolerance.

10

15 9. A composition of Claim 8, wherein the protein is a protein associated with rheumatoid arthritis.

10. A vaccine for use in inducing an immune response in an individual comprising all or a portion of a stress protein or all or a portion of a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the stress protein conjugated to a substance to which an immune response is desired or to a portion of the substance sufficient to induce an immune response in an individual.

20

25 11. A vaccine of Claim 10 in which the stress protein is a mycobacterial stress protein or a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the mycobacterial stress protein to induce an immune response in an individual to whom it is administered.

30

12. A vaccine of Claim 10 in which the substance against which an immune response is desired is selected from the group consisting of: proteins, peptides, oligosaccharides, lipids, carbohydrates, organic molecules and a combination thereof.

13. A vaccine for use in inducing an immune response in an individual comprising a recombinant fusion protein which includes all or a portion of a stress protein or all or a portion of a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the stress protein fused to a substance against which an immune response is desired or to a portion of the substance sufficient to induce an immune response in an individual.

14. A vaccine of Claim 13 in which the stress protein is a mycobacterial stress protein or a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the mycobacterial stress protein to induce an immune response in an individual to whom it is administered.

15. A vaccine of Claim 14 in which the protein is the HIV gag or pol protein.

16. A composition for use as an agent to induce immune tolerance, comprising a stress protein conjugated to a substance to which an immune response is desired.

17. A vaccine for use in enhancing in an individual an immune response, comprising all or a portion of a stress protein conjugated to a substance to which an immune response is desired or to a portion of the

substance sufficient to enhance an immune response in the individual.

18. A vaccine of Claim 17 in which the stress protein is selected from the group consisting of: mycobacterial stress proteins, bacterial stress proteins, fungal stress proteins, viral stress proteins and parasitic stress proteins.

5  
10  
15  
18. A composition comprising a stress protein for use in producing or enhancing an immune response in an individual, wherein the stress protein is in sufficient quantity to elicit the desired immune response, and the stress protein is conjugated to a substance against which an immune response is desired or to a portion of the substance sufficient to produce or enhance an immune response in the individual.

20  
25  
28. A composition comprising a stress protein for use in immunizing an individual against a subsequent infection by a pathogen, wherein the stress protein is in sufficient quantity to produce an immune response sufficient to protect the individual against subsequent infection by the pathogen, and the stress protein is conjugated to a substance against which an immune response is desired or to a portion of the substance sufficient to produce an immune response in the individual.

30  
33. A vaccine for use in inducing an immune response in an individual comprising all or a portion of a stress protein or all or a portion of a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the stress protein and a

substance against which an immune response is desired or to a portion of the substance sufficient to induce an immune response in an individual.

22. A vaccine of Claim 21 in which the stress protein is  
5 a mycobacterial stress protein or a protein having an  
amino acid sequence sufficiently homologous to the  
amino acid sequence of the mycobacterial stress  
protein to induce an immune response in an individual  
to whom it is administered.

10 23. A vaccine of Claim 21 in which the substance against  
which an immune response is desired is selected from  
the group consisting of: proteins, peptides,  
oligosaccharides, lipids, carbohydrates, organic  
molecules and any combination thereof.

15 24. A composition for use as an agent to induce immune  
tolerance, comprising a stress protein and a  
substance to which an immune response is desired.

20 25. A vaccine for use in enhancing in an individual an  
immune response, comprising all or a portion of a  
stress protein and either a substance to which an  
immune response is desired or a portion of the  
substance sufficient to enhance an immune response in  
the individual.

25 26. A vaccine of Claim 25 in which the stress protein is  
selected from the group consisting of: mycobacterial  
stress proteins, bacterial stress proteins, fungal  
stress proteins, viral stress proteins and parasitic  
stress proteins.

27. A composition comprising a stress protein and a substance against which an immune response is desired or a portion of the substance sufficient to produce or enhance an immune response in an individual for use in producing or enhancing an immune response in an individual, wherein the stress protein is in sufficient quantity to elicit the desired immune response .

5

28. A composition comprising a stress protein and a substance against which an immune response is desired or to a portion of the substance sufficient to produce or enhance an immune response in the individual for use in immunizing an individual against a subsequent infection by a pathogen, wherein the stress protein is in sufficient quantity to produce an immune response sufficient to protect the individual against subsequent infection by the pathogen.

10

15

29. A composition for use as an agent to induce an immune response in an individual to whom it is administered, comprising all or a portion of a stress protein or all or a portion of a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the stress protein to be capable of inducing an immune response in an individual to whom it is administered.

20

25

30. A composition for use as an agent to induce an immune response in an individual to whom it is administered, comprising all or a portion of a stress protein or all or a portion of a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the stress protein conjugated to a

30

substance against which an immune response is desired or to a portion of the substance sufficient to induce an immune response in the individual.

31. A composition for use as an agent to induce an immune response in an individual to whom it is administered, comprising a recombinant fusion protein which includes a) all or a portion of a stress protein or all or a portion of a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the stress protein and b) a substance against which an immune response is desired or a portion of the substance sufficient to induce an immune response in the individual.

32. A composition for use as an agent to induce immune tolerance, comprising a stress protein.

33. A composition for use in treating an autoimmune disease; comprising all or a portion of a stress protein or all or a portion of a protein having an amino acid sequence sufficiently homologous to the amino acid sequence of the stress protein to induce immune tolerance in an individual to whom it is administered.

34. A composition of Claim 36 for treating rheumatoid arthritis.

35. A conjugate comprising a stress protein joined with a substance against which an immune response is desired.

36. The conjugate of Claim 35 wherein the stress protein is the hsp70 or the hsp60 protein.

37. The conjugate of Claim 35 wherein the substance is selected from the group consisting of: proteins, peptides, oligosaccharides, lipids, carbohydrates, organic molecules and combinations thereof.

5 38. The conjugate of Claim 37 wherein the protein is selected from the group consisting of: ovalbumin, influenza virus hemagglutinin protein, human immunodeficiency virus gag protein and human immunodeficiency virus pol protein.

10 39. A fusion protein comprising a stress protein fused to a protein against which an immune response is desired.

15 40. The fusion protein of Claim 39 wherein the stress protein is a heat shock protein and the protein is a human immunodeficiency viral protein.

41. The fusion protein of Claim 40 wherein the heat shock protein is hsp70 and the human immunodeficiency viral protein is p24 protein.

20 42. A method of generating antibodies to a substance comprising the steps of:

25 a) introducing an effective amount of a conjugate comprised of a stress protein joined to the substance into a mammalian host;

b) removing the antibodies produced by the host to the substance from the host; and

c) purifying the antibodies thereby generating antibodies to the substance.